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## Infrastructure

### Can DC Power Cut Data Center Costs?

By **Jeffrey Burt**  
 March 27, 2006

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Gannett is revamping its Washington data center's power infrastructure, having added another string of traditional AC power supplies prompted in part by the move to bring the company's Web hosting operation in-house.

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However, Gannett officials expect the media company's hosting capacity to grow and are already planning for ways to keep the 15,400-square-foot data center powered up and cooled as that occurs. One option under study is the use of DC power distribution within the data center.

"The question for us is, Does it make sense to go down the same [AC] road if there's an option out there that can save us money?" said Gary Gunnerson, IT architect for Gannett, in McLean, Va., and an eWEEK Corporate Partner.

Analysts said the drumbeat for DC power is likely to increase through June, when the **Electric Power Research Institute** will host a two-day data center conference focusing on DC power in Washington.

While many in the industry have brushed off DC power, calling it more marketing hype than reality, others—including Intel, Hewlett-Packard and Sun Microsystems—are interested. That trio is part of a project funded by the California Energy

Commission in which industry players are working with Lawrence Berkeley National Laboratory, in Berkeley, Calif., to create a prototype of a DC-powered data center in Chatsworth, Calif., by September.

Meanwhile, there seems to be some traction for DC power in the industry. Rackable Systems officials say that 35 percent of the \$83 million in revenue the company generated in the fourth quarter of last year was related to DC power deployments. Rackable offers DC solutions at the rack, row and data center levels.

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Traditionally, AC comes into the data center from an outside power source. Once inside the facility, it goes through multiple conversions back and forth with DC before finally reaching the servers, which run on DC. However, at those conversion points, electricity is lost and heat is generated, persuading some users to look at an all-DC network as a way of increasing efficiency and saving money.

"During the [Internet] boom, data centers were being built like crazy," said Josh Gondenhar, senior director of engineering for Rackable, in Milpitas, Calif. "There was a lot of capacity, and that capacity has been scooped up."

Proponents say that DC power produces 20 to 40 percent less heat and improves server reliability by 27 percent. In addition, given the options in some DC layouts, fewer parts in the power string mean lower cost and easier management.

However, there are drawbacks, including the larger cables that are needed to



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Our upcoming conference will introduce technology that allows organizations to

transmit DC power. In addition, enterprises might be reluctant to retrofit their data centers for DC power, particularly when a host of new technologies—from multicore processors and virtualization to more efficient power supplies and liquid cooling devices—are being developed. It might make sense for high-end businesses with a lot of systems or those that are building new data centers, said Gartner analyst Carl Claunch in Los Altos, Calif.

Mark Potter, vice president of HP's BladeSystem unit, said the Palo Alto, Calif., company and others are putting more intelligence into traditional AC power supplies to make them more efficient. "[DC power] is really a lot of marketing," Potter said.



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But a number of industry players say DC power can have a greater role in the data center. "We would like to get high-voltage DC out of the UPS [uninterruptible power supply, a battery backup in AC systems] and distribute it all throughout the data center," said Pavan Kumar, a power research engineer in Intel's Corporate Technology Group, in Hillsboro, Ore. "But we realize ... data centers can't change over just like that."

Nevertheless, demonstrations of DC power's potential at the rack level are under way, said David Geary, vice president of engineering at Baldwin Technologies, a College Park, Md., power management company that has studied DC power in the data center for two years. Baldwin also is part of the Berkeley project and is interested in using off-the-shelf products that can be pieced together for data centers, he said.

For example, Pentadyne Power, also in Chatsworth, offers a flywheel technology that can replace UPS devices, Geary said. That caught the eye of Gannett's Gunnerson, who said the flywheel technology could lower construction and management expenses. The flywheels are light and spin very fast, and they have fewer moving parts than a UPS device. The flywheel also has an expected life span of about 15 years, triple that of cells in a generator, and doesn't result in ongoing battery maintenance.

However, there are questions, primarily about proving the cost savings on power and cooling, Gunnerson said.

Senior Writer John G. Spooner contributed to this report.



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